UNITED STATES PATENT AND TRADEMARK OFFICE

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

	Application No.	Applicant(s)
Office Action Summary	10/645,677	MOORE, ROGER KENNETH
	Examiner	Art Unit	
	Brian L. Albertalli	2626	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☐ Responsive to communication(s) filed on _____.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-23_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-23_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☒ All b) ☐ Some * c) ☐ None of:

      1. ☒ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1.   Claims 20-22 are objected to because of the following informalities:

Claims 20-22 recite the limitation "the frames". There is insufficient antecedent

basis for this term, because each of claims 20-22 depends from claim 17 (which does

not mention "frames").

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2.   The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3.   Claim 11 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply

with the enablement requirement. The claim(s) contains subject matter which was not

described in the specification in such a way as to enable one skilled in the art to which it

pertains, or with which it is most nearly connected, to make and/or use the invention.

Claim 11 requires that segments in a database are coded by LPC, GSM coding, or

"other coding schemes". The term "other coding schemes" is not enabled by the

specification, because "other coding schemes" may include any coding scheme

available. Clearly, the specification does not provide an adequate description of every

available coding scheme known. Thus, "other coding schemes" is not enabled by the

specification.

4.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

5.   Claims 2, 11, and 21 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point out and distinctly claim the subject matter

which applicant regards as the invention.

Claim 2 is directed to an output waveform synthesizer that is "essentially the

same as the synthesizer used in a conventional parametric synthesizer". The term

"essentially the same" renders the claim indefinite because it cannot be determined

exactly what requirements must be met so that a particular waveform synthesizer is

"essentially the same" as a conventional waveform synthesizer.

Claim 11 requires that segments in a database are coded by LPC, GSM coding,

or "other coding schemes". The term "other coding schemes" renders the claim

indefinite because it cannot be determined what other coding schemes are included by

this term.

Regarding claim 21, the phrase "e.g." (meaning "for example") renders the claim

indefinite because it is unclear whether the limitation(s) following the phrase are part of

the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7.   Claims 1-5, 12, and 17-20 are rejected under 35 U.S.C. 102(b) as being

anticipated by Page et al. (U.S. Patent 6,175,821).

In regard to claim 1, Page et al. disclose a speech synthesizer having an output

stage (Fig. 1, elements 3, 4, and 6) for converting a phonetic description to an acoustic

output, the output stage including a database of recorded utterance segments (recorded

speech 3), in which the output stage:

a. converts the phonetic description to a plurality of time-varying parameters (text

to speech synthesizer 4 converts a series of diphones into parameters indicating

phoneme boundaries and pitchmarks, column 4, line 62 to column 5, line 21);

b. interprets the parameters as a key for accessing the database to identify an

utterance segment in the database (once the speech synthesizer is completed,

message generator 6 accesses recorded speech database 3 to retrieve portions of the

message, column 5, lines 36-45), and

c. outputs the identified utterance segment (the retrieved recorded segments and

synthesized speech are concatenated and output, column 5, lines 45-47);

in which the output stage further comprises an output waveform synthesizer that

can generate an output signal from the parameters, whereby, in the event that the

parameters describe an utterance segment for which there is no corresponding

recording in the database, the parameters are passed to the output waveform

synthesizer to generate an output signal (variable portions of the message which are

not available in the recorded speech database 3 are generated by the speech

synthesizer 4 and included in the output signal, see Fig. 2 and column 5, line 65 to

column 6, line 21).

In regard to claim 2, Page et al. disclose the output waveform synthesizer is

essentially the same as the synthesizer used in a conventional parametric synthesizer

(text to speech converter 4 is a standard TTS, column 4, lines 5-8).

In regard to claim 3, Page et al. disclose the database is populated to achieve a

compromise between quality and memory requirement most appropriate to a specific

application (since certain portions are often used, they are stored in recorded speech

database 3 to make the recording sound as natural as possible, column 5, lines 58-61).

In regard to claim 4, Page et al. disclose the database is populated with

segments that are most likely to be required to generate a range of output

corresponding to the application of the synthesizer (since certain portions are often

used, they are stored in recorded speech database 3 to make the recording sound as

natural as possible, column 5, lines 58-61).

In regard to claim 5, Page et al. disclose the database is populated with utterance segments derived from speech by a particular individual speaker (the same speaker, column 2, lines 23-24).

In regard to claim 12, Page et al. disclose the parameters are generated in regular periodic frames (see Figs. 5A-5C, regular pitch marks 79-91).

In regard to claim 17, Page et al. disclose a method of synthesizing speech comprising:

a. generating from a phonetic description a plurality of time-varying parameters that describe an output waveform (text to speech synthesizer 4 converts a series of diphones into parameters indicating phoneme boundaries and pitchmarks, column 4, line 62 to column 5, line 21);

b. interpreting the parameters to identify an utterance segment within a database of such segments that corresponds to the audio output defined by the parameters and retrieving the segment to create an output waveform (once the speech synthesizer is completed, message generator 6 accesses recorded speech database 3 to retrieve portions of the message, column 5, lines 36-45) ; and

c. outputting the output waveform (the retrieved recorded segments and synthesized speech are concatenated and output, column 5, lines 45-47);

in which, if no utterance segment is identified in the database in step b, as corresponding to the parameters, an output waveform for output in step c is generated

by synthesis (variable portions of the message which are not available in the recorded speech database 3 are generated by the speech synthesizer 4 and included in the output signal, see Fig. 2 and column 5, line 65 to column 6, line 21).

In regard to claim 18, Page et al. disclose steps a to c are repeated in quick succession to create an impression of a continuous output (the retrieved recorded segments and the synthesized speech are concatenated to form a continuous output, see Fig. 2 and column 5, lines 45-47).

In regard to claim 19, Page et al. disclose the parameters are generated in discrete frames, and steps a to c arc performed once for each frame (see Figs. 5A-5C, regular pitch marks 79-91; these are generated for the entire message, column 4, line 62 to column 5, line 21).

In regard to claim 20, Page et al. disclose the frames are generated with a regular periodicity (see Figs. 5A-5C, regular pitch marks 79-91).

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9.   Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Page et

al., in view of Holm et al. (U.S. Patent 5,850,629)

In regard to claim 6, Page et al. do not disclose the database is populated with

utterance segments derived from speech by speakers of a particular gender.

Holm et al. disclose a database for speech synthesis, wherein the database is

populated with utterance segments derived from speech by speakers of a particular

gender (male or female voice databases can be selected, column 9, lines 3-6).

It would have been obvious to one of ordinary skill in the art at the time of

invention to modify Page et al. to populate the database with utterance segments

derived from speech by speakers of a particular gender, because this would allow a

user to select a voice sound that they preferred.

10.   Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Page et

al., in view of Nukaga et al. (U.S. Patent 7,113,909).

In regard to claim 7, Nukaga et al. do not disclose the database is populated with

utterance segments derived from speech by speakers having a particular accent.

Nukaga et al. disclose a database for speech synthesis, wherein the database is

populated with utterance segments derived from speech by speakers having a particular

accent (a memory is populated with a specific speech style, column 5, lines 48-59;

which includes a particular accent, column 6, lines 17-24).

It would have been obvious to one of ordinary skill in the art at the time of

invention to modify Page et al. to populate the database with utterance segments

derived from speech by speakers having a particular accent, because providing a

particular accent is advantageous in the internationalization of a device, as taught by

Nukaga et al. (column 2, lines 37-41).

11.   Claims 8, 9, 16, 22, and 23 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Page et al., in view of Kamai et al. (U.S. Patent 5,864,812).

In regard to claims 8 and 9, Page et al. do not disclose the database is indexed

or that the index values for accessing the database are the values of the time-varying

parameters.

Kamai et al. disclose a speech synthesizer that comprises an indexed database

(Fig. 24, F1 index and F2 index, column 15, lines 19-22), wherein time varying

parameters converted from phonetic descriptions are used as index values for

accessing the database (phoneme information is converted to parameters, column 16,

lines 37-42 and lines 57-67; which are then used to access the speech segment

database, column 17, lines 4-28).

It would have been obvious to one of ordinary skill in the art at the time of

invention to modify Page et al. to index the database by values of the time varying

parameters, because indexing the database by the time varying parameters allows the

synthesized speech to be generated "moment to moment", thus reducing the size of the

database, as taught by Kamai et al. (column 17, line 62 to column 18, line 9).

In regard to claims 16 and 22, Page et al. do not disclose the parameters correspond to speech formants.

Kamai disclose the parameters correspond to speech formants (phoneme information is converted to formant information, column 16, lines 37-42 and lines 57-67; which are then used to access the speech segment database, column 17, lines 4-28).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Page et al. to derive formants as parameters for accessing the database, because indexing the database by formants allows the synthesized speech to be generated "moment to moment", thus reducing the size of the database, as taught by Kamai et al. (column 17, line 62 to column 18, line 9).

In regard to claim 23, Page et al. do not disclose the output segments for any one frame are selected as a function of the parameters of several frames.

Kamai disclose the output segments for any one frame are selected as a function of the parameters of several frames (the formant frequencies selected from the database depend on speech segment being currently synthesized and the type of consonant connected next, column 17, lines 29-33).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify Page et al. to base the output for any one frame as a function of the parameters of several frames, because this would result in more natural sounding output.

12.   Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Page et al., in view of van Santen et al. (U.S. Patent 7,010,488).

In regard to claims 10 and 11, Page et al. do not disclose the segments within

the database are coded using linear predictive coding, GSM coding, or other coding

schemes.

Van Santen et al. disclose a speech synthesizer comprising a speech segment

database, wherein the segments within the database are coded using linear predictive

coding, GSM coding, or other coding schemes (LPC, column 4, lines 9-12).

It would have been obvious to one of ordinary skill in the art at the time of

invention to modify Page et al. to code the segments in the database using linear

predictive coding, GSM coding, or other coding schemes, because this would reduce

the size of the database, as taught by van Santen et al. (column 2, lines 60-64).

13.   Claims 13, 14, 15, and 21 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Page et al., in view of Official Notice.

In regard to claims 13, 14, and 21, Page et al. do not disclose the precise period

length of the frames.

Official Notice is taken that it is notoriously well-known in the art that frames are

approximately 10 ms when working with speech signals, because this period length

provides the best comprise between time domain resolution and frequency domain

resolution for slowly varying speech parameters.

It would have been obvious to one of ordinary skill in the art at the time of

invention to modify Page et al. so that the frames were approximately 10 ms, because

this period length provides the best comprise between time domain resolution and

frequency domain resolution for slowly varying speech parameters.

In regard to claim 15, Page et al. disclose at each frame, an output waveform is

generated these being reproduced in succession to create an impression of continuous

output (the retrieved recorded segments and the synthesized speech are concatenated

to form a continuous output, see Fig. 2 and column 5, lines 45-47).

Conclusion

14.   The prior art made of record and not relied upon is considered pertinent to

applicant's disclosure. Henton (*Challenges and Rewards in Using Parametric or

Concatenative Speech Synthesis*) disclose the tradeoffs between parametric and

concatenative speech synthesis. Cruickshank (U.S. Patent Application Publication

2003/0158734) disclose a speech synthesizer that uses a traditional TTS converter

when a word is out-of-vocabulary. Cecys (U.S. Patent 5,704,007) discloses using both

recorded sources and generated sources for speech synthesis. Pechter et al. (U.S.

Patent 6,879,957) disclose a speech synthesizer that, when a whole word is not in a

database, generates the word by concatenating diphones from the database.

15.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Brian L. Albertalli whose telephone number is (571) 272-

7616. The examiner can normally be reached on Mon - Fri, 8:00 AM - 5:30 PM, every second Fri off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Hudspeth can be reached on (571) 272-7843. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BLA 4/23/07

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